

2008

# Effect of Headline® and Soybean Plant Population on Diseases and Yield

Daren S. Mueller

*Iowa State University*, [dsmuelle@iastate.edu](mailto:dsmuelle@iastate.edu)

Kenneth T. Pecinovsky

*Iowa State University*, [kennethp@iastate.edu](mailto:kennethp@iastate.edu)

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## Recommended Citation

Mueller, Daren S. and Pecinovsky, Kenneth T., "Effect of Headline® and Soybean Plant Population on Diseases and Yield" (2008). *Iowa State Research Farm Progress Reports*. 741.

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# Effect of Headline® and Soybean Plant Population on Diseases and Yield

## **Abstract**

Fungicides on soybeans provided growers an effective management strategy for foliar diseases, especially soybean rust. However, many questions about fungicide and how common practices affect fungicide efficacy are still unresolved. One possible cultural practice that may affect fungicide efficacy is plant population. Higher plant populations may lead to a denser canopy, which may lead to a more conducive microenvironment for certain plant diseases. The denser canopy also may reduce the penetration of fungicides to the lower canopy. The objective of this study was to evaluate the efficacy of fungicide in four different soybean plant populations.

## **Keywords**

Plant Pathology

## **Disciplines**

Agricultural Science | Agriculture | Plant Pathology

## Effect of Headline® and Soybean Plant Population on Diseases and Yield

Daren Mueller, extension specialist  
Department of Plant Pathology  
Ken Pecinovsky, farm superintendent

In the fall, final plant population was determined, soybeans were harvested, and yields were calculated.

### Introduction

Fungicides on soybeans provided growers an effective management strategy for foliar diseases, especially soybean rust. However, many questions about fungicide and how common practices affect fungicide efficacy are still unresolved. One possible cultural practice that may affect fungicide efficacy is plant population. Higher plant populations may lead to a denser canopy, which may lead to a more conducive microenvironment for certain plant diseases. The denser canopy also may reduce the penetration of fungicides to the lower canopy. The objective of this study was to evaluate the efficacy of fungicide in four different soybean plant populations.

### Materials and Methods

On May 18, Crows 2317RR was planted at four populations (Table 1). Headline® (pyraclostrobin, BASF) was applied to half of the plots on July 30, when soybeans were at growth stage late R3 (beginning pod) to early R4 (full pod). All other plots were the non-treated controls. There were three replications of each plant population and fungicide treatment combinations.

On September 6, disease was assessed in each plot using a scale of 0–5, where 0.5 = < 1% severity, 1 = 1–10% severity, 2 = 10–20% severity, 3 = 20–40% severity, 4 = 40–60% severity, and 5 = > 60% severity.

### Results and Discussion

Diseases found at very low levels included sudden death syndrome, white mold, Cercospora leaf blight, and frogeye leaf spot. Septoria brown spot was found in each plot and was affected by both plant population and fungicide application. Septoria brown spot was more severe with higher plant populations and no fungicides.

Final populations ranged from 80 to 90% of the initial population and were not influenced by the fungicide application.

There was no difference in yield between the different plant populations. There was a statistically significant yield increase for all treated plots (61.9 bushels/acre) compared with the non-treated plots (57.7 bushels/acre).

Overall, fungicides were more effective at reducing Septoria brown spot severity in the lower plant populations. However, this did not result in a difference in yield.

### Acknowledgements

We would like to thank BASF, Monsanto, and Crows Hybrids for providing seed and pesticides for this study.

**Table 1. Effect of fungicide and plant population on soybean diseases and yield.**

Fungicide	Initial population	Final population	Brown spot <sup>a</sup>	Cercospora leaf blight <sup>a</sup>	Frogeye leaf spot <sup>a</sup>	White mold <sup>a</sup>	Sudden death syndrome <sup>a</sup>	Yield (bu/acre)
Headline®	80,000	72,600	1.67*	0.00	0.00	0.17	0.17	62.5*
Headline®	128,000	115,192	2.33*	0.33	0.00	0.00	0.17	61.7
Headline®	175,000	138,424	2.67*	0.33	0.00	0.17	0.17	63.3*
Headline®	225,000	190,696	3.00*	0.83	0.17	0.00	0.00	60.3*
Average for Headline® plots			2.42*	0.37	0.04	0.09	0.13	61.9*
None	80,000	71,632	4.00	0.67	0.17	0.00	0.00	57.4
None	128,000	117,128	3.67	0.67	0.33	0.17	0.17	59.8
None	175,000	143,264	4.33	0.50	0.17	0.00	0.17	56.7
None	225,000	194,568	5.00	0.83	0.33	0.00	0.00	56.7
Average for Non-treated plots			4.25	0.67	0.25	0.04	0.09	57.7

<sup>a</sup>All diseases were rated on a scale of 0 to 5, where 0 = no disease and 5 = > 60% severity.

\*Statistically different (P = .05) than the non-treated control.